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NOMINATIONS

HEARING

BEFORE THE

COMMITTEE ON LABOR AND HUMAN RESOURCES UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

ON

EDWARD A. KNAPP, OF NEW MEXICO, TO BE DIRECTOR, NATIONAL SCIENCE FOUNDATION
AND

PATRICIA DIAZ DENNIS, OF CALIFORNIA, TO BE A MEMBER, NATIONAL LABOR RELATIONS BOARD

APRIL 13, 1983

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NOMINATIONS

WEDNESDAY, APRIL 13, 1983

U.S. SENATE,
COMMITTEE ON LABOR AND HUMAN RESOURCES,
Washington, D.C.

The committee met, pursuant to notice, at 10:35 a.m., in room 424, Dirksen Senate Office Building, Senator Orrin G. Hatch (chairman) presiding.

Present: Senators Hatch, Quayle, Kennedy, and Pell.

Also present: Senator Dominici.

OPENING STATEMENT OF SENATOR HATCH

The CHAIRMAN. We will move to the nomination of Dr. Edward A. Knapp, nominee for Director of the National Science Foundation. If we could have order, I would appreciate it.

We have Senator Pete Domenici here, who is under tremendous time pressure as chairman of the Budget Committee, to introduce Dr. Knapp. I am under tremendous pressure to get to that Budget Committee meeting myself, but it will take me about another 15 or 20 minutes.

Could we have order in this room?

I am pleased to welcome Dr. Edward A. Knapp to our committee hearing this morning. Even though he is getting to be a regular here on Capitol Hill, testifying on behalf of the National Science Foundation before our committee, the Appropriations Committee, the Commerce Committee, and the House Appropriations and Science and Technology Committees, he is finally getting the opportunity to testify on behalf of his own nomination to be Director of NSF. It is certainly our pleasure to have him with us.

It is also a distinct pleasure to have Senator Domenici with us to introduce our nominee. The fact that he would take time from the Budget Committee markup is a testimony to the high regard he has for Ed Knapp and to the importance he places on solid leadership at the Nation's leading science agency.

At this point we will insert the opening statement of Senator Kennedy.

[The statement referred to follows:]

OPENING STATEMENT OF SENATOR KENNEDY

Senator KENNEDY. The National Science Foundation has contributed to America's outstanding success in science and technology for over 30 years.

By supporting basic and applied research, the NSF encourages young people to enter scientific and technical fields; it keeps scientists aware of the constantly changing body of knowledge in their fields, and it offers the general public an understanding of the issues of ethics and values that arise in science and engineering.

This Nation faces great challenges in its struggle to regain economic strength and security; a vigorous and creative scientific community is essential to meet these challenges. We can not afford to allow our national investment in research and development to decline if we are to meet the challenge of the competition in the international economy.

Only last week, we were once again told by leading experts that we are in danger of losing out to the Japanese in the area of what is known as the fifth generation of computers, the so-called supercomputers. We cannot permit America's role as the leader in the world in basic research on intelligent machines to erode. We cannot standy idly by while this happens.

Thus, it is clear that the person at the helm of the National Science Foundation must be an individual of not only scientific competence and management skill, but an individual who recognizes the full spectrum of issues that go into the making of a dynamic scientific research enterprise.

It is clear that the leader of the NSF must be able to recognize the important contributions of all of the various areas of science to the health of science. Chemistry, economics, physics, psychology, mathematics, geography, biology, and astronomy are but a few of the critical parts to the body of modern science; each provides information that should not be dismissed or diminished because a new fad of thinking arises that praises one area while condemning another.

Furthermore, the leader of the NSF must be able to recognize the potential of all Americans, regardless of age, race, gender, or handicap to make important contributions to basic science research. Thus, no NSF Director should be willing to defer to artificial social barriers which limit women, minorities or the handicapped from full participation in America's research enterprise.

We are here, today, to consider the nomination of an individual who would steer the NSF, it is hoped, successfully through the traps and the pitfalls of the administrative and political process, as well as through the deadends and blind alleys of the many false promises of the research effort.

Today, we will face a person who brings many years experience as a scientist and an administrator to the task of continuing the success of the NSF.

Dr. Edward Alan Knapp is a man of excellent education and good reputation. From a technical point of view, he seems adequately qualified for the position of Director of NSF. However, there are a number of concerns that I have that I hope Dr. Knapp can resolve prior to his confirmation.

Because of the staff changes that followed Dr. Knapp's recess appointment as director of NSF and the number of stories printed in the New York Times, Washington Post, and Science magazine, I am concerned that politics may start to play a far greater role in the operation of NSF than it has historically.

Because the NSF proposed fiscal year 1984 budget level funded programs for women and minorities while at the same time giving at 17.8 percent average increase to the NSF, I am concerned that the NSF may be embarking on a retreat from its legislatively mandated commitment to enhancing the opportunities for all Americans in our Nation's research enterprise.

Today, this committee should receive some assurances. Today, this committee must be told that it will not have to watch a political distortion of the science enterprise nor an effort to abandon social justice by the NSF.

Today, I hope that Dr. Knapp will provide us with those assurances.

The CHAIRMAN. Senator Domenici, we will turn to you at this time. Again, I will ask for order in this room.

Senator Domenici.

STATEMENT OF HON. PETE V. DOMENICI, A U.S. SENATOR FROM THE STATE OF NEW MEXICO

Senator DOMENICI. Thank you very much, Mr. Chairman and members of the committee.

Obviously at this date, since the distinguished nominee, Dr. Edward A. Knapp, has been serving as Acting Director of the National Science Foundation for some time, you and the members of the committee have already grown to know him, so it would be presumptuous on my part to go into too much detail regarding his background. Suffice it to say that with reference to his scientific education and his long-term commitment to science in America I believe his strong commitment to the NSF are obvious.

The President's budget, I think, is somewhat of a testimonial to his hard work and that of the President's Science Adviser. That budget, while it is frugal in most areas, asks for significant increases for the National Science Foundation.

Basically I would only tell you one humorous story about his early life as a scientist. I am told by one of his dear friends in Los Alamos that 20 years ago, while he was working on the meson facility, that he used to get up every morning and arrive before the sun came up and stay every night until the sun went down. The only time in a number of years that that did not occur, he arrived "late"—8:30 in the morning—and his good friend said, "What happened? Are you losing interest?" He said, "No, Dr. Rosen, what happened is, my wife had a baby last night and I am a couple of hours late."

From what I can tell, he has been doing an excellent job. I submit that somebody of his caliber, somebody of his vision, is precisely what is needed. I would submit my remarks for the record and hope that we would not leave the NSF in an acting posture for too much longer, and that this committee would recommend to the Senate that he be confirmed.

I thank you very much, Mr. Chairman and members of the committee.

The CHAIRMAN. Thank you, Senator Domenici. We will put your complete remarks in the record, and we appreciate your taking

time from the Budget Committee. If you can give me some time to get up there for that education vote——

Senator DOMENICI. We are waiting on you.

The CHAIRMAN. I know and I appreciate it. I apologize. We will move as quickly as we can.

Senator DOMENICI. All right. Fine.

The CHAIRMAN. Thank you, Senator.

We will turn to Senator Kennedy now, Dr. Knapp, and then to Senator Pell right after Senator Kennedy for any remarks they would care to make at this point.

Senator KENNEDY. Thank you very much, Mr. Chairman.

I understand the time constraints but there are just a few matters that I would like to address. During the period of time that I have been on this committee, I have been enormously interested in the Science Foundation, and we have seen the Science Foundation go through a variety of different experiences.

There has been some attempt under other administrations to put political appointees into positions of responsibility in the NSF, but I think generally over the period of the 20 years I have been in the Senate, the agency itself has been free from political interference. There have been some exceptions but I think by and large that has been true, and I think that is one of the reasons that—beyond the great talent and the enormous qualitative excellence that has been developed in the NSF—I think that is part of the reason it has been so successful.

Now I am sure you are aware that there have been these allegations or charges about the politicization of the NSF under your leadership, and I want to give you an opportunity to respond to them. In the Washington Post, I am sure you are probably aware, as of February 2, 1983—written by Phillip Hilts, and I will include the article in the record—it says,

> NSF sources said of the deal to gain major increases for the agency in austere times, it was an arrangement in which the agency's top managers would be replaced with people who better reflect the administration's point of view. That purge occurred shortly after Edward Knapp stepped in as the agency's new director. It was made clear to the Deputy Director and the four Assistant Directors that they would have to leave. Knapp says the idea to clear out all the agency's top management, a move unprecedented in the history of the relatively nonpolitical agency, was his as much as the White House's.

How much was it of the White House, first of all, and then let's hear how much it was of yours.

The CHAIRMAN. Could we hold off questions until after our opening statements are made and Dr. Knapp has an opportunity to make——

Senator KENNEDY. Oh, I'm sorry. That's fine.

[Material supplied follows:]

INSIDE: THE SCIENCE AGENCIES

At a time when most of the federal government is frozen in place, the government's only pure science agency, the National Science Foundation, has some of the biggest proposed increases in President Reagan's fiscal 1984 budget request.

The proposed increase for the agency is about 18 percent above the agency's fiscal 1983 appropriation; funding for certain parts of the agency would increase as much as 60 percent over this year's budget.

The new budget reverses the cuts of earlier years, and completes the transformation of the NSF to an agency reflecting the Reagan administration's goals. It would heap extra money onto the areas most closely related to industry and defense, chiefly physics, mathematics and engineering.

But it would let several of the social sciences lose even more ground to inflation following research cutbacks in the past two budgets. And the administration has not replaced the tens of millions of dollars cut from science education programs in the earlier Reagan budgets.

NSF sources said part of the deal to gain major increases for the agency in austere times was an arrangement in which the agency's top managers would be replaced with people who better reflected the administration's point of view.

That purge occurred shortly after Edward A. Knapp stepped in as the agency's new director. It was made clear to the deputy director and the four assistant directors that they would have to leave.

Knapp says the idea to clear out all the agency's top management—a move unprecedented in the history of the relatively nonpolitical agency—was his as much as the White House's.

So far, no replacements have been selected. The procedure for appointment begins when the National Science Board, the NSF's policy arm, submits a list of acceptable candidates to the White House—a list that still is being prepared. Then the White House, in consultation with Knapp, will choose the final nominees from the list—or elsewhere. The whole process is expected to take months.

The biggest boost in the $1.3 billion agency budget would come in funds for new scientific instruments. NSF estimates the amount authorized will jump from $67.9 million to $180.2 million.

The move comes after years of panicked warnings from scientists that aging instruments are hurting both research and science education. However, two years ago, the Reagan administration erased from the budget a science instrumentation program proposed by President Carter's science adviser, Frank Press.

GEORGE A. KEYWORTH
. . . credited with NSF budget rise

Program by program, one of the biggest increases—21.5 percent—would come in the mathematical and physical sciences. The biggest chunk of that increase would come in industry-oriented "materials research."

The physics component of the budget would increase by 21 percent—and this doesn't include the additional big increases in the Energy Department budget to build the huge particle-accelerating machines at Stanford University and the federal government's Fermilab in Illinois. The substantial new funds to construct the big machines of physics may help the United States leapfrog past the Europeans, who have taken an undisputed lead in high-energy physics after 40 years of domination by the United States.

The budget would give an even larger percentage increase to engineering, a field beyond the original mission of the NSF—to encourage pure, not applied, science.

The NSF fared better than any other science agency in the 1984 budget, and administration officials are giving the credit to the increasingly persuasive George A. Keyworth, the former weapons physicist who is the president's science adviser.

The $4 billion budget of the National Institutes of Health would virtually hold steady, with an increase of less than 1 percent. The National Institutes of Mental Health would continue to be redefined—from an agency handling social, behavioral and biological research to one concerned with research that is more strictly biological.

At the Energy Department, general science programs supporting basic physics would get a hefty 16 percent increase, while the administration would continue to reduce funding for research into alternative energy sources.

—*Philip J. Hilts*

W. POST - FEB. 21, 1983 A13

Science Agency Director Removes 3 After White House Pressure

By Philip J. Hilts
Washington Post Staff Writer

In an unprecedented move, the new director of the National Science Foundation sought the resignations of the heads of three of the agency's scientific branches this week after the White House pressured him to put its appointees in the jobs.

Director Edward A. Knapp acknowledged that the White House had made the request, but said he would have chosen new people anyway to form his own management team.

The action has surprised leading scientists because the science agencies traditionally have been protected from the political housecleaning that takes place when a new administration comes into office.

The NSF, with a billion-dollar annual budget, is the main source of funds for basic, non-medical scientific research in the United States.

A month ago Knapp said he would not be "housecleaning" at the NSF, but this week he asked for—and received—the resignations of Donald Langenberg, deputy director of the agency and its assistant director for the biological, behavioral and social sciences; Frank Johnson, assistant director for astronomical, atmospheric, earth and ocean sciences; and Eloise Clark, assistant director for behavioral and social sciences.

Johnson had planned to resign anyway, but the other two apparently had not. All the other NSF assistant directorships that are presidentially appointed positions are already vacant.

"I am very disappointed," said William McElroy, former NSF director and until recently chancellor of the University of California at San Diego. "There is no reason for this kind of thing below the level of deputy director [of the whole agency]."

"Our government has to depend on professional people. If the people are incompetent, okay. But there is no way of saying someone like Eloise Clark is incompetent. She is a first-rate scientist and everyone knows it."

"It comes as a surprise to all of us," said Lewis M. Branscomb, chairman of the National Science Board, which oversees NSF policy. "I hope this will not be regarded as a precedent-setting event."

Knapp said yesterday that top officials in both the White House Personnel Office and the White House's Office of Science and Technology Policy spoke to him about seeking the resignations of agency officials.

Asked whose idea it was, Knapp replied, "Of course, the presidential personnel office wants to have its appointees in every presidential slot in the United States. There is no question about that .... Of course it's their idea.

But he added, "I was not forced to any decision by any of the parties. I made the decision that the correct thing to do was to get the search started, ... to make a team for me while I am the manager.

Knapp said had he considered the tradition of keeping on agency officials from one administration to the next, but decided that was outweighed by his desire to have his own team.

He said another consideration was his desire to go along with the White House, which, he said, "was going forward with us for an enhanced budget in a time of very difficult stress, [and] where they want me to be successful" in selling the fiscal 1984 budget, reflecting new Reagan administration priorities, to Congress.

McElroy, who was NSF director under President Nixon, said that selling a budget to Congress is no reason to dismiss personnel below the level of deputy director, since they have no direct role in budget presentations.

Knapp acknowledged yesterday that the swift manner in which he forced the resignations was a mistake. "I was too abrupt .... I am not by nature a person who does things like this easily," he said, reflecting on his initiation into Washington political life.

"I didn't come to the agency to politicize it. I came to manage it, and the agency needs management," he said.

Knapp is a friend and former colleague of George Keyworth, the president's science adviser.

New Leader for Science Foundation

By PHILIP M. BOFFEY
Special to The New York Times

WASHINGTON, Dec. 7 — When the White House announced a few weeks ago that President Reagan had appointed Edward A. Knapp, a physicist, to be director of the National Science Foundation, the three-sentence notice attracted little attention.

Obscurity is almost a way of life at the foundation, an agency that spends a billion dollars a year to promote the advance of American science, chiefly by supporting the research projects of thousands of academic scientists. In fact, Dr. Knapp is somewhat obscure even in the scientific community. His name was not on the list of candidates proposed by the foundation's board to fill the vacancy created when John B. Slaughter resigned to become chancellor of the main campus of the University of Maryland.

But the foundation's low profile seems to be an asset at a time when budget-cutters are scrutinizing programs. Its budgets have fared comparatively well, and the newly appointed director, who must still be confirmed by the Senate, says he is determined to maintain that trend.

How independent a hand he will have is not clear. On Nov. 12, Dr. Knapp scoffed at news reports that the Administration intended to clean out all of his top assistants who were holdovers from the Carter Administration. "I'm not about to have any head-hunting campaigns at the foundation," he said. "I'm not going to ask for any resignations."

'I Made the Decision'

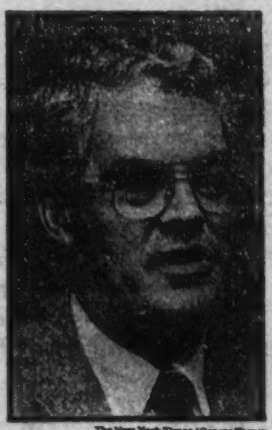
But on Monday he acknowledged that, he has, in fact, asked the last two Carter holdovers to leave. He said he wanted his own team in place but declined to say whether he had been ordered to dismiss the holdovers. "I made the decision and I'll live with it," he said.

While the foundation is considered the most important source of Federal support for basic scientific research, it has not escaped criticism and even ridicule. Over the years, members of Congress have publicly made fun of some of its research projects, including those on the mating habits of a Central American toad, the language behavior of chimpanzees and the reasons people fall in love.

Religious conservatives once crusaded against the foundation, charging that it subverted the values of 10-year-olds with an anthropology course that discussed how primitive Arctic hunters practice infanticide and geronticide. And disgruntled scientists have sometimes complained that the foundation operates a buddy system in which lucrative grants are handed out to scientists at elite universities while worthy competitors at lesser institutions are frozen out.

Congress Called 'Supportive'

But none of this has had much effect on the core of the foundation's programs. Total appropriations soared from $322,000 in the fiscal year 1963 to $646,000 in the fiscal year 1973, and, after a downturn last year, to more than a billion dollars for the fiscal year 1983.



The New York Times / George Tames
Edward A. Knapp

"Congress has been very supportive," said a staff member of the House Science and Technology Committee. "People are looking at research as a way to deal with the economic problems."

Only two major programs have suffered severely in recent years. The Reagan Administration cut large chunks out of the budgets for science education, which it considers primarily a state and local responsibility. And it sliced research in social and behavioral science, a move widely interpreted as retaliation against liberal activists who use social science data to push for changes they favor.

Congress successfully pressed for restoration of some of the financing. And Dr. Knapp says he understands that the Administration has "reconsidered its position" on both issues. He believes that the foundation will be able to fashion a catalytic role in science education and slowly build social science research by emphasizing "the nonpolitical aspects."

When the foundation was established in 1950, it was expected to become a potent political shaper of scientific progress in all Federal agencies, but that never happened. It has always been a puny actor compared with such agencies as Defense, Energy and Agriculture. Even today, after years of steady growth, the foundation provides less than one-fifth of the Federal Government's total support for basic research.

Science Adviser's Friend

That support can, however, be crucial to academic researchers in such fields as mathematics, ground-based astronomy, anthropology and environmental biology whose work is of little interest to other agencies. The foundation is the only Government agency charged with insuring the overall health of American science; it is the central bank to which any scientist can apply for financial support.

The 50-year-old Dr. Knapp seems to have been picked to head the foundation partly because he is a friend of President Reagan's science adviser, George A. Keyworth 2d, with whom he worked at the Los Alamos National Laboratory in New Mexico. Dr. Knapp, who holds a doctorate from the University of California at Berkeley, spent his entire professional career at Los Alamos, where he most recently headed the accelerator technology division.

Nevertheless, leaders of the scientific community who have spoken with Dr. Knapp since his appointment was announced have said that they see him as a solid scientist.

Dr. Frank Press, president of the National Academy of Sciences, said that Dr. Knapp "has the potential for being a great director even though he is relatively unknown to the scientific community.

"He is formidable, a first-class scientist, well-educated, with extensive management experience."

Lewis M. Branscomb, chairman of the foundation's board, said of Dr. Knapp: "All of us are favorably impressed. He was not on our first list of candidates, but he is an excellent man."

The CHAIRMAN. Senator Pell.

Senator PELL. I have no statement, except to say that I had a very good talk with Dr. Knapp and I think that he will be a fine appointee, and I look forward to supporting him. I will be very interested in the exchange with Senator Kennedy because I, too, have been bothered in the past by these stories about the politicization of the National Science Foundation.

Senator KENNEDY. Well, I have a rather extensive opening statement if you want to go into all that.

The CHAIRMAN. We will put that in the record at the appropriate point. I appreciate that, Senator Kennedy.

Dr. Knapp, if you could just briefly summarize your statement, we will put your complete statement in the record. We are pressured for time and I would like to ask some questions and let other members of this panel have the opportunity to ask questions as well.

STATEMENT OF DR. EDWARD A. KNAPP, NOMINATED TO BE DIRECTOR, NATIONAL SCIENCE FOUNDATION

Dr. KNAPP. I can summarize my statement, Senator, or I can respond to your questions. It is your choice.

The CHAIRMAN. If we could go directly to the questions, we will put your complete statement in the record at this point. It is an excellent statement.

[The prepared statement of Dr. Knapp and response to Senator Pell's question follow:]

STATEMENT OF

DR. EDWARD A. KNAPP

NOMINEE FOR DIRECTOR

NATIONAL SCIENCE FOUNDATION

BEFORE THE

COMMITTEE ON LABOR AND HUMAN RESOURCES

UNITED STATES SENATE

APRIL 13, 1983

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

I AM PRIVILEGED TO APPEAR BEFORE YOU AS PRESIDENT REAGAN'S NOMINEE TO BE DIRECTOR OF THE NATIONAL SCIENCE FOUNDATION, AND I WELCOME THIS OPPORTUNITY TO DISCUSS WITH YOU THE ROLE PLAYED BY THE FOUNDATION IN MAINTAINING THE HEALTH AND VITALITY OF THE UNITED STATES SCIENCE AND ENGINEERING RESEARCH ENTERPRISE. IN MY REMARKS, I WANT TO SHARE WITH YOU MY ASSESSMENT OF THE CURRENT CONDITION OF AMERICAN FUNDAMENTAL RESEARCH IN SCIENCE AND ENGINEERING, DISCUSS SOME CURRENT NEEDS, AND SUGGEST TO YOU WHAT I BELIEVE ARE THE WAYS THAT THE FOUNDATION CAN AND SHOULD ADDRESS THEM.

IT IS FAIR TO SAY THAT THIS COUNTRY'S SCIENCE AND TECHNOLOGY ARE ENVIED AROUND THE WORLD. SINCE THE END OF WORLD WAR II, UNITED STATES SCIENTISTS HAVE WON MORE NOBEL PRIZES IN THEIR FIELDS THAN THE

SCIENTISTS OF ANY OTHER COUNTRY. TWO OF THE PAST THREE WINNERS OF THE FIELDS MEDAL -- THE MATHEMATICS ANALOG OF THE NOBEL PRIZE -- HAVE BEEN AMERICAN MATHEMATICIANS. IN THIS COUNTRY TODAY, MORE SCIENTISTS AND ENGINEERS ARE ENGAGED IN RESEARCH AND DEVELOPMENT THAN IN ANY OTHER COUNTRY OF THE WESTERN WORLD.

EVEN SO, THIS IS NO TIME TO RELAX IN SATISFACTION WITH THE UNITED STATES' POSITION IN FUNDAMENTAL SCIENCE AND ENGINEERING RESEARCH. THERE ARE WIDESPREAD CONCERNS REGARDING THE ABILITY OF THE UNITED STATES TO CONTINUE ITS PREEMINENCE IN HIGH TECHNOLOGY IN THE FUTURE, AND THE NATION FACES AN ARRAY OF PROBLEMS THAT ARE SO COMPLEX THAT MANY APPEAR TO DEFY SOLUTIONS. WHEN EFFECTIVE AND QUICK FIXES ARE NOT FORTHCOMING, CITIZENS TEND TO BECOME FRUSTRATED, AND PERHAPS ANXIOUS ABOUT THE FUTURE. EXISTING UNDERSTANDING SEEMS INADEQUATE, AND NEW INSIGHTS AND KNOWLEDGE ARE CRITICALLY NEEDED.

LET ME BE THE FIRST TO SAY THAT QUICK FIXES ARE NOT THE PROVINCE OF THE NATIONAL SCIENCE FOUNDATION. TO THE CONTRARY, BY STATUTE THE NSF IS THE FEDERAL AGENCY CHARGED WITH RESPONSIBILITY FOR THE OVERALL HEALTH OF SCIENCE IN THIS COUNTRY. WHAT IMPELS ME, AS NOMINEE FOR THE DIRECTOR OF THE FOUNDATION, IS THE CONTINUED AND CONTINUING VIGOR OF SCIENCE AND ENGINEERING IN THE UNITED STATES NOW AND INTO THE NEXT CENTURY. I MUCH PREFER THAT ONE OF MY SUCCESSORS IN THE YEAR 2010 WILL BE ABLE TO SAY, AS I CAN SAY TODAY: "THE CONDITION OF THE NATION'S SCIENCE AND ENGINEERING ENTERPRISE IS STRONG, SOUND, AND ABLE TO DRAW UPON FUNDAMENTAL RESEARCH BEGUN SOME TEN OR MORE YEARS AGO BECAUSE OF THE SUPPORT GIVEN BY NSF AND OTHERS." THE SCIENCE AND

ENGINEERING RESEARCH AND THE TRAINING OF THE NEXT GENERATION OF SCIENTISTS AND ENGINEERS UNDERLAYS FUTURE PROGRESS.

As I look back over the past few years, I see places in the science system which weaken our ability to achieve the goal of ensuring the health of science and engineering that I just mentioned. I am referring, for example, to the growing obsolescence of research instrumentation and facilities at colleges and universities, the rising cost of graduate education in science and engineering, perceived shortages -- developing and existing -- of science and engineering professionals in several areas, and the continuing need to broaden the opportunities for minority and women scientists to contribute their talents to a variety of scientific careers.

I see these as challenges of sometimes rebuilding but always strengthening the base or infrastructure of science and engineering research. Several of these areas involve human resources; others are concerned with physical ones. NSF responses to both must consider the role played by colleges and universities and, in fact, elementary and secondary education. The Foundation's principal arena is the Nation's colleges and universities. These institutions perform a unique dual role:

> It is they who perform most of the fundamental science and engineering research; and
>
> It is they who train future generations of scientists and engineers upon whom the Nation must draw.

In my view, human resources are the key to advances in scientific research, and ultimately, to new technologies and economic and social benefits. The research establishment cannot continue to function as well as it has in the past without a steady flow of young, flexible, creative researchers providing new insights into our scientific understanding of the universe in which we live. And these researchers must be equipped with state-or-art instrumentation to do true frontier research. Neither is sufficient; we must have both.

The obsolescence to research instrumentation and facilities in our colleges and universities undermines their capacity to perform cutting-edge science and to compete effectively with their counterparts in other countries. Graduate education, the training ground for future researchers in science and engineering, is seriously impared. The problem of providing adequate instrumentation is complex because the various scientific disciplines pursue research according to different styles, and have varying needs for types and amounts of instrumentation and facilities. There is, however, no question in my mind that upgrading of research instrumentation and facilities is an essential first step in attracting and keeping young scientists and engineers in research careers.

I would like to give the question of the training of scientists and engineers a little more attention at this point.

THERE ARE SEVERAL KEY STAGES IN THE LONG AND LINEAR PROCESS THROUGH WHICH YOUNG SCIENTISTS AND ENGINEERS ARE DEVELOPED AND BROUGHT INTO ACTIVE CAREERS. A WEAKNESS IN ONE STAGE CAN PROPAGATE AND AMPLIFY. LET ME BE MORE SPECIFIC. THE ENROLLMENT OF STUDENTS IN SCIENCE AND MATHEMATICS CLASSES IN THE ELEMENTARY AND SECONDARY SCHOOLS APPEARS TO BE DECLINING STEADY; THERE ARE QUESTIONS ABOUT THE QUALITY OF SCIENCE AND MATHEMATICS THAT IS BEING OFFERED; AND THE NUMBER OF QUALIFIED TEACHERS OF THESE SUBJECTS IS ALSO DECREASING. IT IS IN THE ELEMENTARY AND SECONDARY SCHOOLS THAT STUDENTS FIRST LEARN ABOUT THE PHYSICAL SCIENCES AND ENGINEERING. IF THEY CHOOSE AT THIS EARLY STAGE IN THEIR EDUCATION TO AVOID COURSES IN SCIENCE AND MATHEMATICS, THEY CAN EFFECTIVELY REMOVE THEMSELVES FROM ANY OPPORTUNITY LATER TO PURSUE A CAREER IN SCIENCE OR ENGINEERING.

THE EFFECT OF THIS EARLY-IN-LIFE DECISION WHICH IS DIFFICULT TO REMEDY AT THE UNDERGRADUATE LEVEL IS TWO-FOLD. FIRST, IT ELIMINATES CHALLENGING AND REWARDING CAREER OPPORTUNITIES FROM BRIGHT YOUNG PEOPLE, AND REDUCES THE NUMBER OF PROSPECTIVE SCIENTISTS AND ENGINEERS. SECOND, STUDENTS WHO AVOID SUCH STUDIES AT THE PRECOLLEGE LEVEL, EVEN IF THEY HAVE NO PARTICULAR INCLINATION TOWARD A SCIENTIFIC CAREER, RISK LOSING KNOWLEDGE NECESSARY TO INFORMED CITIZENSHIP IN A RAPIDLY CHANGING, TECHNOLOGICALLY BASED SOCIETY. IN BOTH CASES, THE NATION AS A WHOLE SUFFERS.

HOW, THEN, SHOULD THE FOUNDATION PROCEED IN IMPROVING THESE AREAS OF NEED? I INTEND TO PLACE HIGH PRIORITY ON BOTH THE INSTRUMENTATION AND HUMAN RESOURCES ASPECTS OF THE FOUNDATION'S RESEARCH PROGRAMS. TO

THAT END, NSF IS PROPOSING, FOR FY 1984, AN INCREASED EMPHASIS ON GRADUATE STUDENTS, SEVERAL ACTIVITIES TO INCREASE THE QUALITY OF SCIENCE AND MATHEMATICS TEACHING IN THE NATION'S ELEMENTARY AND SECONDARY SCHOOLS, AND THE PRESIDENTIAL YOUNG INVESTIGATOR AWARDS. AS FOR RESEARCH INSTRUMENTATION AND FACILITIES, EACH OF THE FOUNDATION'S RESEARCH ACTIVITIES HAS DEVELOPED PLANS FOR RESPONDING TO ITS OWN SPECIAL EQUIPMENT NEEDS. SOME FIELDS MAY INCLUDE FUNDS FOR EQUIPMENT IN REGULAR PROJECT RESEARCH GRANTS; OTHERS MAY USE SPECIAL EQUIPMENT PROGRAMS; AND STILL OTHERS MAY FOCUS ON THE FUNDING OF SPECIAL FACILITIES. THIS STRATEGY PERMITS FLEXIBILITY TO ADAPT TO COSTS, TYPES OF EQUIPMENT AND PATTERNS OF USAGE APPROPRIATE TO EACH SPECIAL AREA OF SCIENCE AND ENGINEERING RESEARCH AND MAXIMIZES THE EFFECT OF THE FOUNDATION'S INVESTMENT.

I ALSO INTEND TO IMPLEMENT, DURING THE COMING YEAR, A NEW MANAGEMENT PHILOSOPHY FOR FOUNDATION PROGRAMS IN SUCH AREAS AS INTERNATIONAL SCIENCE, THE MINORITIES AND WOMEN IN SCIENCE, AND RESEARCH AT UNDERGRADUATE INSTITUTIONS. IN THIS NEW OPERATING MODE, NSF DISCIPLINARY RESEARCH PROGRAM OFFICERS WILL BE REQUIRED TO ADOPT A BROADER VIEW OF THEIR RESPONSIBILITIES FOR THE HEALTH OF SCIENCE. MY PURPOSE IS TO BRING THE HERETOFORE SEPARATE EMPHASES DIRECTLY INTO THE DAY-TO-DAY OPERATION OF THE RESEARCH PROGRAMS. I BELIEVE THAT THIS WILL PROVIDE GREATER OPPORTUNITIES FOR PARTICIPATION, MORE HIGH QUALITY SCIENCE AND ENGINEERING RESEARCH, AND WILL DEVELOP A STRENGTHENED AND ENLARGED SCIENTIFIC PERSONNEL POOL.

THE TASK OF DIRECTING THE NATIONAL SCIENCE FOUNDATION IN THE MIDDLE 1980s IS AN EXCITING AND DEMANDING CHALLENGE. I EXPECT, AND WILL DO ALL THAT I CAN, TO INSURE THAT THE FOUNDATION ACCOMPLISHES THE GOALS MANDATED BY THE CONGRESS, AND TO CONTRIBUTE TO THE LONG TERM BENEFIT OF THIS NATION AND THE WORLD SOCIETY.

I APPRECIATE THIS OPPORTUNITY TO PRESENT THESE IDEAS TO YOU, AND WOULD BE PLEASED TO ANSWER ANY QUESTIONS THAT YOU MAY HAVE.

23-147 O—83——2

STATEMENT FOR COMPLETION BY PRESIDENTIAL NOMINEES

PART I: ALL THE INFORMATION IN THIS PART WILL BE MADE PUBLIC

Name: Knapp (LAST) Edward (FIRST) Alan (OTHER)

Position to which nominated: Asst. Director, Natl. Science Foundation Date of nomination: July 12, 1982

Date of birth: 7 (DAY) 3 (MONTH) 1932 (YEAR) Place of birth: Salem, Oregon

Marital status: Married Full name of spouse: Jean Hartwell Knapp

Name and ages of children: Sandra D. 25; Mary L. 17; David A. 23; Robert J. 20

Education:

Institution	Dates attended	Degrees received	Dates of degrees
Pomona College	1950 1954	B.A.	6/54
University of California Berkeley	1954 1958	Ph.D.	9/58

Honors and awards: List below all scholarships, fellowships, honorary degrees, military medals, honorary society memberships, and any other special recognitions for outstanding service or achievement.

Tiletson Physics Prize, Pomona College

Fellow, Am. Physical Society

Sigma Xi

Memberships: List below all memberships and offices held in professional, fraternal, business, scholarly, civic, charitable and other organizations for the last five years and any other prior memberships or offices you consider relevant.

Organization	Office held (if any)	Dates
American Physical Society		1955-pres.
AAAS		1970-pres
Institute of Electrical and Electronic Engineers		1979-pres.
Cosmos Club		1980-pres.
American Association of Physicists in Medicine		1972-1978

Employment record: List below all positions held since college, including the title or description of job, name of employer, location of work, and dates of inclusive employment.

University of California, Los Alamos National Laboratory

Staff Member	1958- 65
Group Leader	1965- 76
Assistant Division Leader	1968- 71
Associate Division Leader	1971- 78
Alternate Division Leader	1976- 78
Division Leader	1978- Present

Government experience: List any advisory, consultative, honorary or other part-time service or positions with Federal, State, or local governments other than those listed above.

Nuclear Science Advisory Committee DOE/NSF

High Energy Physics Advisory Panel (HEPAP) DOE

and see attached C.V.

Published writings: List the titles, publishers and dates of books, articles, reports or other published materials you have written.

see attached C.V.

Political affiliations and activities: List all memberships and offices held in or financial contributions and services rendered to all political parties or election committees during the last five years.

Political contributions to Republican Party

candidates from New Mexico in 1981 ($35) and 1982($50)

Future employment relationships:

1. Indicate whether you will sever all connections with your present employer, business firm, association or organization if you are confirmed by the Senate.

I will be in leave of absence status with the University of California

2. State whether you have any plans after completing government service to resume employment, affiliation or practice with your previous employer, business firm, association or organization.

I plan to resume employment with the University of California

3. Has a commitment been made to you for employment after you leave Federal service?

Yes

4. Do you intend to serve the full term for which you have been appointed or until the next Presidential election, whichever is applicable?

Yes

Potential conflicts of interest:

1. Describe any financial arrangements, deferred compensation agreements or other continuing financial, business or professional dealings with business associates, clients or customers who will be affected by policies which you will influence in the position to which you have been nominated.

I know of none

2. List any investments, obligations, liabilities, or other financial relationships which constitute potential conflicts of interest with the position to which you have been nominated.

I know of none. Science Applications, Inc., while doing extensive contract work for the U.S. Government, recieves no funding from the National Science Foundation Mathematical and Physical Sciences Directorate, to the best of my knowledge.

3. Describe any business relationship, dealing or financial transaction which you have had during the last five years whether for yourself, on behalf of a client, or acting as an agent, that constitutes a potential conflict of interest with the position to which you have been nominated.

None

4. List any lobbying activity during the past 10 years in which you have engaged for the purpose of directly or indirectly influencing the passage, defeat or modification of any Federal legislation or of affecting the administration and execution of Federal law or policy.

General presentation of the scientific merit of Los Alamos National Laboratory projects to Federal Agencies and Congressmen.

5. Explain how you will resolve any potential conflict of interest that may be disclosed by your responses to the above items.

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

January 31, 1983

nsf

OFFICE OF THE
DIRECTOR

Honorable Orrin G. Hatch
Chairman
Committee on Labor and Human Resources
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

I am writing to confirm that the financial disclosure form of the Committee on Labor and Human Resources which I completed and returned to the Committee last fall is a current and accurate statement of my financial status as of this date. The only change to be noted is a change in my position at the National Science Foundation from the Assistant Director for Mathematical and Physical Sciences to the Director of the Foundation.

I will be pleased to respond to any further questions you may have.

Sincerely yours,

Edward A. Knapp

Edward A. Knapp
Director

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

May 5, 1983

Honorable Orrin G. Hatch
Chairman
Committee on Labor and
Human Resources
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

This is in response to your letter of April 19, 1983, to Dr. Knapp that forwarded the following question from Senator Pell in connection with Dr. Knapp's confirmation hearing:

Question: Could you please bring me up to date on the oceanographic research vessel, R/V Endeavor, that the University of Rhode Island has under charter from the National Science Foundation? Are you satisfied with the programs and studies being undertaken by the University in connection with this vessel?

Answer: The Foundation continues to be well satisfied both with the University of Rhode Island's operation of Endeavor and its oceanographic research. This satisfaction is based on favorable reviews of ship use and individual projects by ocean scientists and research ship operators from other oceanographic institutions. Based on such favorable evaluations, the Foundation has continued its support of the operation of and improved equipment for Endeavor and of a number of projects in physical, chemical and biological ocean sciences as well as submarine geology and geophysics. We look forward to further contributions by the University to both marine education and research.

If any additional information is needed on this topic, please let me know.

Sincerely yours,

M. Kent Wilson
Director, Office of Planning
and Resources Management

The CHAIRMAN. If we could go to the questions, maybe I could lead off.

Dr. Knapp, you have been associated with Los Alamos for your entire career in science. Do you think that your lack of experience in a university would be a handicap, since NSF performs most of its mission through universities? How is your perspective, brought from a national laboratory, going to be helpful?

Dr. KNAPP. My entire career at Los Alamos National Laboratory has been associated with basic research or applied research associated with the generation of energy, such as fusion power. Having had a background in basic research, I understand a good bit of the Foundation's research emphases.

The Foundation does interact primarily with the universities and colleges in this country. Los Alamos is run by the University of California, so I have been an employee of a university during all of my career, even through Los Alamos is a national laboratory. The fact that I have not been directly connected with a campus of the university allowed me to see vividly, when I came to the Foundation 8 months ago, some problems that confront the universities today.

During the past 10 years, for example, the support for instrumentation, for graduate students, and for postdoctoral fellows in mathematics has deteriorated markedly from my student experience. In my term as Director of the Foundation, I will try hard to return the flavor, the excitement, and the funding for research at the universities, so that they may continue to produce research and the scientists and engineers to carry forward this country's industry into the next decade.

The CHAIRMAN. Thank you, doctor.

Two criticisms of the national labs are that they raid university faculties and that the research does not contribute directly to the education of students. Do you happen to agree with these criticisms? How can NSF facilitate better cooperation and coordination between the universities and the national laboratories?

Dr. KNAPP. Certainly the second of those criticisms is true, the national laboratories don't contribute to the education of students. However, at the Los Alamos Laboratory, the meson physics facility of which I was a major designer was built for research by university faculty. Today, most of the research mounted on the Los Alamos meson physics facility is undertaken by university users.

The first criticism—that national laboratories raid university faculty—is incorrect. There are professional scientists in industry, in national laboratories, in universities. They work throughout the economy and the defense establishment. Certainly, faculty members and scientists compete in various fields, but I don't think the competition could be considered as "raiding."

The CHAIRMAN. Thank you.

Currently there are four top positions to be filled at NSF. I might ask, what is the status of the search for a new Deputy, new Assistant Directors of Mathematical and Physical Sciences, Biological, Behavioral, and Social Sciences, and Astronomical, Atmospheric, Earth, and Ocean Sciences?

Dr. KNAPP. A list of nominees for Deputy Director has been sent to the White House from the National Science Foundation—a list

generated by me and the National Science Board. We expect within 2 weeks to have lists of nominees for Assistant Directors of Astronomical, Atmospheric, Earth, and Ocean Sciences, and Mathematical and Physical Sciences. The nominee for Biological, Behavioral, and Social Sciences will be sent shortly thereafter.

The CHAIRMAN. OK. How do these vacancies impede the implementation of your management plan? As you know, I am personally, as I think all of us are, anxious for your plan to succeed. It would seem that having good people in place to carry out your intentions would be a condition for giving assurances that the programs you have in mind for mainstreaming into the research directorates won't be lost in the shuffle.

Dr. KNAPP. We have moved as rapidly as possible in the relatively cumbersome process for selecting nominees to these positions. We have searched widely for nominees by polling the professional scientific organizations, members of the National Science Board, and several other organizations.

The Board and I have worked carefully to screen these nominees. I feel that we have an excellent set of nominees, but I don't think we could have moved much faster to generate these lists. I badly need to have these positions filled.

The CHAIRMAN. Thank you.

Now I know you are familiar with the components of the Equal Opportunities in Science and Technology Act, more simply referred to as the women and minorities in the science program. Both Senator Kennedy and I are proud of this program, which of course is designed to develop the human capital of women and minorities in science and engineering. I think the goals within that program are perfectly consistent with your goals at NSF. Now would you examine the other authorized activities of this program with an eye toward more full implementation of this act?

Dr. KNAPP. The exact question, sir?

The CHAIRMAN. I would like to see a greater implementation of that act and every effort made to implement that.

Dr. KNAPP. I believe the management plan I have put forward for the Foundation—the Assistant Directors are working on the design—will make more effective the implementation of the Foundation's programs for women and minorities.

The CHAIRMAN. All right. Thank you.

Dr. KNAPP. These are important parts of the program that I have in mind for my term as Director of the Foundation. I would like to see these programs brought forward in the Foundation's priorities.

The CHAIRMAN. All right. We will now turn to Senator Kennedy, and maybe some more interesting questions.

Senator KENNEDY. Well, we will continue just on that last one.

I appreciate your comments and statements here on the question of the women and the handicapped and minorities. I think that all of us are very mindful that woefully just the statistics and figures of the amounts of women that are in the scientific area, the percentage of population is extremely small. They have the most difficulty both in terms of the differential in salaries. The differential in terms of opportunities is still rather dramatic, and I think you are probably aware of the work of this committee and a number of us on that particular issue.

We welcome your statement and commitment on this. Of course, it is not reflected in the budget considerations, I don't believe, is it? I understand it——

Dr. KNAPP. The budget does not increase the funds to be used in the programs for women and minorities. However, when my new plan for management of these programs is instituted, NSF will be able to increase the number of women and minority participants, without increases in the budget.

Let me explain. The set-aside budgets for women and minorities will be used perhaps only once per minority researcher—to get him or her into the mainstream of science. From that point on, they will be funded directly by the main programs. The more easily this transition can be made, the more women, minorities, or others disadvantaged in the selection process, can be moved into the mainstream of research.

Senator KENNEDY. Well, we will have an opportunity to continue to work with you in this program, and have every intention of looking forward to that chance. The fact is, the graduate students working as research assistants—which play a significant role, obviously, in the work of the NSF funds—due to their close association with faculty, they receive invaluable learning experiences in the whole area of science and technology. Now I don't believe you keep any data on the race or the gender of these research students, do you?

Dr. KNAPP. NSF has data but it is not well documented. NSF has data on surveys but cannot connect the data collected from its surveys with particular institutions and particular programs.

Six months ago, I asked the grants management staff to tell me the distribution of graduate students supported by NSF on research grants. I wanted to know how many women, how many minorities, how many foreign students were supported in these programs.

The research programs are the major source of support for graduate students in the sciences. More than 10,000 graduate students are supported on research grants, and NSF awards only 1,000 fellowships. The research programs are by far the most pervasive form of support.

Senator KENNEDY. What answers were you given when you asked those questions?

Dr. KNAPP. I was told NSF has sketchy data, and the staff is trying to generate systems that can get better data on these——

Senator KENNEDY. Well, that shouldn't be terribly complicated, should it?

Dr. KNAPP. There are problems.

Senator KENNEDY. You are talking about 10,000 students. How many are women or minorities? It would seem to me that it would not take a very elaborate kind of a management review program to get that kind of information, would it?

Dr. KNAPP. I don't think it should be very difficult, either.

Senator KENNEDY. Well, how are we leaving it? Are you going to get it, and will you let this committee know?

Dr. KNAPP. There are some problems in the statutes having to do with the kind of questions that can be asked.

However, I think we can get around those problems, and we are looking at that. We will report to you——

Senator KENNEDY. If you would prefer it, I would be glad to write you a letter, or you could communicate to the committee or communicate with us what you find as result of that review.

The CHAIRMAN. Why don't you write a letter, and then you respond to it. OK?

Dr. KNAPP. We will communicate, yes, sir.

Senator KENNEDY. Fine.

As I mentioned earlier, I don't think allocating resources is necessarily an indication of priorities but often it is, and I do take note that even though there has been some significant increase in budget in the math and physics and engineering, the hard sciences, of about 17 or close to 18 percent, there has been none for the women and minorities program. As I understand, you say that you think that you can carry forward your responsibility in these areas by your other management recommendations. Is that correct?

Dr. KNAPP. Yes, sir.

Senator KENNEDY. I had to excuse myself just briefly when the Chair was asking about the filling of the various vacancies. Maybe we could go back to that question that I was getting to which related to those vacancies. It may or may not, but you make what response that you want.

However, in terms of the politicization of the NSF, how do you respond to those who have indicated that there will be a litmus test in terms of the hiring of various scientists to fill even those slots, and it will be a political litmus test? What assurances can you give that that will not be the case, or can you?

Dr. KNAPP. I can assure you that will not be the case. The National Science Board and I produce a list of nominees for these positions and send it to the White House. The sole criterion for that list has been managerial and scientific skill. There has not been a political test.

The White House then, I presume, will choose from this list of nominees the final nominee for——

Senator KENNEDY. Just as a technical matter, whether we are talking about Democrats or Republicans, why should the White House be—in this particular area regarding the National Science Foundation—involved in the process at all?

Dr. KNAPP. These are Presidential appointments. President Truman vetoed the first National Science Foundation bill passed in 1948 because the Director and the Assistant Directors were to be appointed by the National Science Board. He signed the bill only after it had been redrafted with these positions as Presidential appointments.

Senator KENNEDY. What has been the record? If you can clarify this, have the President's appointments been just completely outsiders? Have they been appointees who have come up through the ranks?

Dr. KNAPP. Very few appointees have come up through the ranks. Usually these appointees come for 2 or 3 years. They are well-known scientists from outside the Foundation who come to provide oversight of the Foundation's activities.

The two persons who had the job of Assistant Director for Mathematical and Physical Sciences—the job which I came to undertake in September 1982—were professors from Cornell and Harvard. Both stayed 2 years in the job and then returned to their university positions.

Senator KENNEDY. How do you respon l to these observations, as I mentioned earlier from the Washington Post, about the purge in NSF to better reflect the administration's view? I think I read you that comment before, and I would be glad to do it again. It said that as part of

> The deal to gain major increases for the agency in austere times, it was an arrangement in which the agency's top managers would be replaced with people who better reflect the administration's point of view. That purge occurred shortly after Edward Knapp stepped in as the agency's new director. It was made clear to the Deputy Director and the four Assistant Directors that they would have to leave. Knapp says the idea to clear out all the agency's top management, a move unprecedented in the history of the nonpolitical agency, was his as much as the White House's.

Dr. KNAPP. It was my decision to ask for the resignations. I wanted to build a team that could assist me in managing the Foundation in a solid way. I felt that I should have my own team to help me do it.

Senator KENNEDY. Evidently that is a rather clear departure, I guess, from other managers of the NSF who felt that they could——

Dr. KNAPP. It isn't a complete departure. I have been told by Foundation staff that there has been turnover at the arrival of new Directors; perhaps not as much, but there has been turnover.

Senator KENNEDY. Well, I guess it is maybe a matter of degree. However, what about this idea that there would be increases in the agency budget if they did see a removal of some of these personnel? Can you tell us, what role did the White House have in the removal of any of these personnel?

Dr. KNAPP. There is no connection at all between the budget increases and personnel turnover.

Senator KENNEDY. There was no person within the White House who talked to you about the removal of any of these people?

Dr. KNAPP. I discussed my plans with the Office of Science and Technology Policy staff, but there was no requirement that any employees be removed in order to get budget increases.

Senator KENNEDY. Now part of the concern I know within the scientific community is particularly with what has happened over at Interior—the firing of a number of individuals, and that the only way that people would be able to get into Interior is clearance with the Republican National Committee—that obviously has sent ripples around. I am sure you are sensitive to that, particularly in an agency which I think has over a period of time been free for the most part of outside interference, political interference. I am interested, obviously, in your assurances that that is certainly your own view about how this agency ought to proceed.

Dr. KNAPP. The National Science Foundation has a large number of committees; each scientific discipline has an oversight committee, and many times subdisciplines have such committees. To my knowledge no political tests have been applied to any appointees to

these committees, nor have I seen anything to indicate that that would be the case in——

Senator KENNEDY. You would resist that type of interference?

Dr. KNAPP. Yes, I would.

Senator KENNEDY. I suppose you are aware of some of these other substantive matters, this whole effort by the Japanese leapfrogging in terms of the computerization, the supercomputer and the fifth generation computer. Are you prepared to make any recommendations to us in the Congress about how to deal with some of these advances that are taking place in other parts of the world?

Dr. KNAPP. Two distinct problems are associated with supercomputers. One is access to supercomputers by university researchers; the other is the American competitive position in supercomputers with respect to the Japanese.

The problem of access and how supercomputers and supercomputation can be used by university faculty in the sciences is one of the more important problems to be discussed at NSF during the next year.

Some sort of computer purchase and networking to cover most of the universities in this country is the proper way to solve the problem of access.

With respect to competition with the Japanese in the production of supercomputers, the United States industry still leads the world in this field, but several innovative U.S. companies are reporting relatively fragile profits. I personally feel that Government policy should encourage these companies to continue their research, but a large Government-funded program designed to stay ahead of the Japanese might be counterproductive now.

Senator KENNEDY. Might be what?

Dr. KNAPP. Counterproductive. It might do more damage than it does good.

Senator KENNEDY. Why is that so?

Dr. KNAPP. The secret weapon, so to speak, of the American economy, particularly in computers, is the entrepreneurial spirit in the Silicon Valley area of California. Large, organized programs usually do not give as much impetus to research as I think would be best for the country.

Senator KENNEDY. Well, you are aware, I am sure, of what happened in terms of the computer industry—for example, in the recessions of the early 1970's—where the companies and the corporations in the computer industry just didn't have the resources to do it. They gave up the research to do it; the Japanese took it up and really moved in a very dramatic and significant way, and gained a very substantial market not only in this country with their commitment on it, but also around the world.

I just was interested to see what sort of fresh ideas that you had about the nature of the relationship, in terms of trying to look at our overall national interests and what we have seen printed in every newspaper in the country about what is happening in many of these countries, Western Europe and Japan, whether it is in the area of computers where we have had some advantage—I come from a State where in many of these new technologies and in the older, traditional industries, we are still doing pretty well—but I don't think there are many people up there who don't believe that

the kind of commitment that is being made overseas is not going to provide a very dramatic challenge to American industry.

I am interested in whether we are going to just continue to do business as usual, or whether you are going to try to look at some creative and innovative new ways of trying to insure that we are not going to lose the computer industry as we did in televisions and as we did in a significant way in automobiles. I am not sure what I am hearing here.

Dr. KNAPP. Perhaps I should clarify a bit. Of course, the National Science Foundation does support computer research and engineering.

Senator KENNEDY. Pretty much tied just to the universities.

Dr. KNAPP. Tied to the universities.

Senator KENNEDY. The NSF has been resistant to trying to find out, or creating innovative and creative ways of tying into the private sector. Remember the amendment that Senator Hatch and I had, going back to 1975 or 1976. Remember the great difficulties we had resisting the positions of the NSF on trying to find ways of bringing both the best in terms of the universities and the best that is being done in the private sector together in a way that is going to serve national interests.

The CHAIRMAN. If you would yield for a second, I am going to have to recess for a few minutes because I have to go upstairs and vote in the Budget Committee. Therefore, what I propose to do is recess for approximately 10 minutes and come right back, and we can finish your questions at that time. OK? We will recess for 10 minutes, until I can get back.

Or, let me make this suggestion: Senator Kennedy will continue the questioning until I get back. I will be back as soon as I can, and then we will finish this out.

As I understand it, Senator Kennedy, you are willing to poll Dr. Knapp out. Is that correct?

Senator KENNEDY. Yes. I have no objection.

The CHAIRMAN. OK. Well, then, as soon as Senator Kennedy's questions are over and you have answered them, we will just make it clear that we will poll your nomination out, hopefully by the end of today.

Then I will move to Mrs. Dennis as soon as I get back.

Senator KENNEDY. I am familiar with Mrs. Dennis' background, and she certainly appears to be qualified for the position. She says in her statement that she is dedicated to the goal of achieving stability in labor-management relations and she will be fair and impartial in the administration of the law. I take her word for it.

I stress my own view that stability can be maintained only if Board members are going to be fair and impartial. I would hope, also, that we could poll her nomination as well and submit questions to her.

The CHAIRMAN. Today's hearing is convened to also consider the nomination of Mrs. Patricia Diaz Dennis to be a member of the National Labor Relations Board.

Late last year the President announced his intention to nominate Mrs. Dennis, and on March 9, the papers were formerly submitted to the Senate.

We are happy to have Mrs. Dennis here, to present her credentials to the committee and to be available for questions. I might add that I have had an opportunity to review her qualifications. And I am impressed with her background and experience as well as her academic achievements. She was an honors graduate at UCLA. She was then a dean's list student in law school as well as executive editor of the school's law review. But perhaps more important, she will bring to the Board a solid decade of experience in the field of labor relations. She has practiced before the National Labor Relations Board. She has been an active participant in the collective bargaining process. And she has had extensive experience in handling grievances and arbitrations.

This kind of experience is invaluable to the Board. Congress has vested the Board with unique responsibilities in overseeing labor-management relations in this country. Congress was well aware of the complexities of industrial life. It was also aware of the difficulties of applying the general provisions of the National Labor Relations Act to the diverse circumstances out of which labor disputes can arise. It therefore concluded that an agency, with a special understanding in the actualities of industrial relations, was best suited for this task. Mrs. Dennis, with her experience in today's collective bargaining process, will surely enhance the Board's expertise.

I have made no secret of my belief that in the past, the Board has ignored the realities of the workplace and unfairly and improperly tilted the act in favor of organized labor, to the detriment of the individual workers and of employers. In the process, the Board's credibility has diminished, as courts of appeals increasingly express doubts about the Board's expertise. I am sure that our nominee today realizes the unique opportunity she has to help restore the public's confidence in the Board and its mission.

Mrs. Dennis, Senator Kennedy and I agree that we are going to poll your nomination out. I think what we will do is make it easy on you. We are going to accept your statement for the record.

[Material supplied follows:]

STATEMENT FOR COMPLETION BY PRESIDENTIAL NOMINEES

PART I: ALL THE INFORMATION IN THIS PART WILL BE MADE PUBLIC

Name: DENNIS (LAST) PATRICIA (FIRST) DIAZ (MAIDEN)

Position to which nominated: National Labor Relations Board Member Date of nomination: March 9, 1983

Date of birth: 10 (DAY) 02 (MONTH) 46 (YEAR) Place of birth: Santa Rita, New Mexico

Marital status: Married Full name of spouse: Michael John Dennis

Name and ages of children: Ashley Elizabeth Dennis Age 8

Geoffrey Diaz Dennis Age 5-1/2

Education:

Institution	Dates attended	Degrees received	Dates of degrees
San Francisco College for Women	Sept. 1965- June 1967	None	Not Applicable
University of North Carolina at Chapel Hill	Sept. 1967- June 1968	None	Not Applicable
University of California at Los Angeles	Jan. 1969- Dec. 1969	A.B.	June 1970
Loyola University of Los Angeles School of Law	Aug. 1970- May 1973	J.D.	June 1973

Honors and awards: List below all scholarships, fellowships, honorary degrees, military medals, honorary society memberships, and any other special recognitions for outstanding service or achievement.

Honors Program-San Francisco College for Women: Dean's List-U.N.C. and U.C.L.A.; Exchange student to University of Toronto, Canada-U.N.C.; Fourragere Honors at Graduation-U.C.L.A.; Executive Editor, Loyola Law Review and Dean's List-Loyola University of Los Angeles School of Law; CORO Foundation Hispanic Leadership Program, Lawyers' Advisory Committee; YWCA Certificate of Achievement

Memberships: List below all memberships and offices held in professional, fraternal, business, scholarly, civic, charitable and other organizations for the last five years and any other prior memberships or offices you consider relevant.

Organization	Office held (if any)	Dates
STATE BAR OF CALIFORNIA	Member	1973-Present
AMERICAN BAR ASSOCIATION		
Labor Law Section	Member	1974-Present
Comm. on Labor Arbitration & Law of		
Collective Bargaining Agreements	Member	1979-Present
LOS ANGELES COUNTY BAR ASSOCIATION		
Labor Law & Human Rights Sections	Member	1974-Present
Barristers Section	Executive Committee	1980-1982
Child Abuse Subcommittee	Chairperson	1980-1981
MEXICAN AMERICAN BAR ASSOCIATION	Member	1976-Present
	Trustee	1979-1980; 1981-1982
	Secretary	1980-1981
RESOURCES FOR INFANT EDUCARERS	Board of Directors	1981-Present

*See Below

Employment record: List below all positions held since college, including the title or description of job, name of employer, location of work, and dates of inclusive employment.

Assistant General Attorney, AMERICAN BROADCASTING CO., Labor Relations & Legal Affairs-West Coast, 4151 Prospect Ave., Hollywood, CA July, 1979-Present

Attorney, AMERICAN BROADCASTING CO., Labor Relations & Legal Affairs-West Coast, 4151 Prospect Ave., Hollywood, CA June, 1976-July, 1979

Attorney, PACIFIC LIGHTING CORP., 810 S. Flower St., Los Angeles, CA October, 1976-May, 1978

Associate Attorney, PAUL, HASTINGS, JANOFSKY & WALKER, 555 South Flower St., 22nd Floor, Los Angeles, CA August, 1973-October, 1976

Summer Associate, PAUL, HASTINGS, JANOFSKY & WALKER, 555 South Flower St., 22nd Floor, Los Angeles, CA May, 1972-August, 1972

Summer Law Clerk, CALIFORNIA RURAL LEGAL ASSISTANCE, 339 Perkins Ave., McFarland, CA May, 1971-August, 1972

*OUR OWN SCHOOL EDUCATIONAL CORPORATION — President 1980-1981; Secretary 1977-1978

FRANKLIN AVENUE SCHOOL ADVISORY COMM. — Member 1980-1981

CORO FOUNDATION HISPANIC LEADERSHIP PROGRAM, Lawyers' Advisory Comm. — Member 1981-1982

Government experience: List any advisory, consultative, honorary or other part-time service or positions with Federal, State, or local governments other than those listed above.

None

Published writings: List the titles, publishers and dates of books, articles, reports or other published materials you have written.

None

Political affiliations and activities: List all memberships and offices held in or financial contributions and services rendered to all political parties or election committees during the last five years.

Committee for Order and Justice, Sept. 30, 1982 $100.00

Community Affairs Institute- Jan. 1, 1982 100.00
Voter Education Project

I publicly endorsed John Van de Kamp, Democratic candidate for California Attorney General in October, 1982. My husband and I held a tea for Dan J. Smith, a Republican candidate for the California Assembly in 1978.

Future employment relationships:

1. Indicate whether you will sever all connections with your present employer, business firm, association or organization if you are confirmed by the Senate.

I will sever all connections with my present employer if the Senate confirms me.

2. State whether you have any plans after completing government service to resume employment, affiliation or practice with your previous employer, business firm, association or organization.

I have no such plans.

3. Has a commitment been made to you for employment after you leave Federal service?

No

4. Do you intend to serve the full term for which you have been appointed or until the next Presidential election, whichever is applicable?

Yes

Potential conflicts of interest:

1. Describe any financial arrangements, deferred compensation agreements or other continuing financial, business or professional dealings with business associates, clients or customers who will be affected by policies which you will influence in the position to which you have been nominated.

None

2. List any investments, obligations, liabilities, or other financial relationships which constitute potential conflicts of interest with the position to which you have been nominated.

American Broadcasting Company common stock

ASARCO, Inc. common stock

Washington Water Power Company common stock

Buckhorn International common stock

Kings River State Bank common stock

3. Describe any business relationship, dealing or financial transaction which you have had during the last five years whether for yourself, on behalf of a client, or acting as an agent, that constitutes a potential conflict of interest with the position to which you have been nominated.

None

4. List any lobbying activity during the past 10 years in which you have engaged for the purpose of directly or indirectly influencing the passage, defeat or modification of any Federal legislation or of affecting the administration and execution of Federal law or policy.

None

5. Explain how you will resolve any potential conflict of interest that may be disclosed by your responses to the above items.

I intend to recuse myself from any cases where any of the corporations in which I own common stock are parties.

The CHAIRMAN. We will put all statements of Senators on the committee into the record.

I also agree with Senator Kennedy as to your excellent credentials and qualifications. I am impressed with your academic background and the wide, pervasive experience you have had in the field of labor law and all related activities.

Therefore, with that we will save you further time from sitting here. We will just put your statement in the record, put our statements in the record. Any questions that anybody cares to write to you, we would appreciate it if you would respond but with that, we intend to poll you out by the end of the day, also. I appreciate Senator Kennedy's and the minority's cooperation in that.

Mrs. DENNIS. Thank you very much.

The CHAIRMAN. Thank you. We are delighted to have you here. I am sorry we didn't announce that a little bit earlier. We knew it a little while ago.

With that, then, I think what I will do is let Senator Kennedy finish his questions to Dr. Knapp and then recess the committee at that time. He can make the record, and we will poll both of you out before the end of the day.

Dr. KNAPP. Fine. Thank you.

The CHAIRMAN. Thanks, Dr. Knapp.

Thanks, Senator Kennedy.

Senator KENNEDY. To sharpen this, Dr. Knapp, Dr. Edward Feigenbaum of Stanford University is cited in an article in the Washington Post, which I have included for the record, as stating that the stakes of a new international contest—this is on the smart computers—are the dominance of an entire industry in the future. Then the article states, "American attempts to move toward the fifth generation computers are scattered among 20 universities and companies." I am just interested in what ideas you have that America should be doing in this area of supercomputer research.

[The article referred to follows:]

U.S. Urged to Aid Development of New Generation of Computers

By Philip J. Hilts
Washington Post Staff Writer

NEW YORK, April 6—The United States will be "betting the future of its entire information processing industry" if it does not counter the new Japanese 10-year crash plan to build a new generation of "smart" computers, computer scientist Edward Feigenbaum said at a computer conference here today.

Feigenbaum, a Stanford University professor and a leading figure in studies of artificial intelligence, or the development of smart computers, said the U.S. response to the Japanese program has so far been "discoordinated" and "not very promising" even though the stakes are the dominance of an entire industry in the future.

The new Japanese program was outlined in some detail by its director, Kazuhiro Fuchi, who also addressed the New York Academy of Sciences computer conference. The project is intended to build what is known as the "fifth generation" of computers, those that are many times faster than current ones and also are built chiefly as knowledge-manipulating machines rather than as number-manipulators.

Such a powerful knowledge-based computer could be the basis for a new generation of commercial products and services, such as "expert systems" like those that now give professional advice to doctors on diagnosis in some limited specialty areas, and to chemists analyzing the molecular structure of substances.

The Japanese will spend at least $200 million in government funds on the new project, Fuchi said. Feigenbaum added that with additional grants from Japanese industry, the project will get about $850 million over the next 10 years. In each of the first four computer generations—those based on the vacuum tube, the transistor, the early integrated circuit and the current densely packed computer chips—computing power was advanced by hundreds to thousands of times.

The fifth generation computers will now concentrate on arrays of hundreds of chips, each computing independently, to multiply the speed of the machine. The machines will gear their fundamental way of operating not to numerical computations but to knowledge processing that uses language and other symbols.

Feigenbaum said that right now, the United States leads the world in basic research on intelligent machines. But he said that historically Americans have been extremely slow to take industrial advantage of their research power. Now, he says, the Japanese could outmaneuver the Americans unless something is done to compete.

Current American attempts to move toward the fifth generation machines are scattered among 20 universities and companies, he said. And he added that even though some of the very best research is being done at corporations, those companies are not taking full advantage of the research.

Also at the conference, a number of computer scientists assessed the state of the art of machine intelligence. They agreed that computers have now been programmed to do tasks that were once thought to require much intelligence. But at the same time, the scientists have discovered that it is the things humans take for granted about behavior that are not likely to be achieved soon by computers.

As Michael Dertouzos of MIT put it, "We can make computers that play world-class chess . . . but we can't make one that can walk into a room and find the chessboard."

The difficulty is that what appears to be complex behavior to humans—mathematics, chess—can be carried out using precise calculations. Computers can handle these. But what computers have not been able to handle are tasks involving pattern recognition and ambiguity, such as viewing a scene in a room and identifying the objects in it.

Machine translation efforts failed because human language is filled with ambiguity, as in the often-cited example of a sentence that a Harvard computer failed to translate: "Time flies like an arrow." The computer could not tell, for example, whether "time flies" might be a variety of fly, like blue-bottle flies, and if the sentence was about the shape of insects.

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By Donald P. Bellisario for The Washington Post

Kazuhiro Fuchi is at the forefront of the efforts of Japan to establish itself as the world leader in computer technology.

Japan's Supercomputer Boss

Heads Effort to Leapfrog U.S. Technology

By Michael Schrage
Washington Post Staff Writer

NEW YORK, April 4—Kazuhiro Fuchi is both the leader and symbol of Japan's attempt to leapfrog America's computer industry and establish itself as the world leader in computer technology.

As director of Japan's Institute for New Generation Computer Technology (ICOT), Fuchi is coordinating Japanese efforts to create a so-called Fifth Generation computer: a technology that would meld ultra-high-speed electronic circuitry with vastly complex operating instructions, producing "intelligent" machines.

Fuchi, a youthful-looking 47, is backed by a 10-year, $450 million commitment from his country's powerful Ministry of International Trade and Industry. He directs a core group of 40 researchers—all under the age of 35. "You do not get a revolution from the old," he said. His researchers come from many of Japan's leading technology companies—Hitachi, Fujitsu, Matsushita and others.

However, "This is not just support for industry," he stressed in an interview. "Our project goal is more than that. I believe: It is to create new technologies for the 1990s."

Although some American computer scientists express their skepticism, others are concerned that America will lose its preeminence in computers to Japan in much the same way as it did its lead in the automobile and consumer electronics industries. Partly in response to the Japanese, the U.S. Defense Department is organizing a "supercomputer" project of its own.

"We did not expect our project

See COMPUTERS, D12, Col. 1

Fuchi Outlines Japan's Supercomputer Plans

COMPUTERS, From D6

would result in such concern," said Fuchi, before a New York Academy of Sciences computers conference. "It's just too early."

The project reflects a profound shift in MITI's philosophy, according to Fuchi. "Japan grew up from the ruins of the war with the government taking care of industry," he said. "Now the role of government is changing to promote more basic research. Government is involved in this basic research because industry won't" do it, he said.

Fuchi said that the project represents Japan's determination to acquire technological self-sufficiency, rather than imitating the West. "We fear that the old style of catching-up research and development will become more and more difficult," says the ICOT outline. Japan's lack of natural resources impels it to seek technology as the means to continue its rapid economic growth.

Fuchi concedes that ICOT's plans are extremely ambitious. "We play the role of a symbol, but we will become a reality," he said. "Basically, I'm saying 'let's hurry up.'"

What Fuchi wants to do is create a new kind of computer architecture to process data in an entirely different way. "The reason we're going to have new hardware is to change the technology of software building," he said. "Current hardware forces programmers to think in restrictive ways."

The goal has been described this way by Edward Feigenbaum, professor of computer science at Stanford University and an authority on artificial intelligence:

"At present, we speak of computer capabilities in terms of millions of arithmetic operations per second. Japanese planners want their machines to handle one million logical inferences per second." One logical inference equals one step in an if-then sequence of reasoning, Feigenbaum has written.

By the end of 1985, Fuchi expects to have a special set of PROLOG computers employing a computer language that expresses knowledge and processes in terms of these logical relationships.

He said that these machines are an interim step in the creation of the supercomputer technologies and will make it easier to create artificially intelligent "expert systems"—computer programs that think like experts.

An expert system in the medical field, for example, could attempt to capture the accumulated knowledge and experience of medical experts in a computer program that would perform medical diagnoses more rapidly and accurately than humans do.

"Our emphasis is on this logical approach," Fuchi said. "Expert systems should be built on logic. We will eventually get to multilayered logic, which will make much richer representations possible."

Fuchi believes that logic has "universal applicability" and that this will lead to what he calls the "inference machine"—the culmination of the Fifth Generation approach.

He said that an inference machine should perform many tasks far beyond the capabilities of today's computers—such as translating Japanese to English by recognizing the subtleties of two complex languages.

Although Fuchi's ambitions are broad, he conceded that several important resources are constrained. "We have far less computer scientists in Japan than in the United States," he said. "One important aspect of this project is that it will grow computer scientists as a byproduct."

Nevertheless, Fuchi is confident that, at least on some levels, the Fifth Generation effort will be a success. Although he would not answer the question directly, he said that he expects Japanese computer science to surpass the United States' before the end of this decade.

"My optimism is not proved yet, of course," Fuchi said.

Dr. KNAPP. The interaction between universities and industry in the computer and other businesses has deteriorated during the past 10 or 15 years. I believe the Foundation must work hard to get closer cooperation between university research and the computer industry.

An interagency committee is looking at the problem of supercomputers, supercomputation, the Japanese competition, and the U.S. position with respect to the development of the next generation of supercomputers. It will come up with a plan involving the National Science Foundation, the Department of Defense, the Department of Energy, other departments such as NASA using supercomputers and needing their development. I think there will be a coherent program for the country.

I doubt the National Science Foundation will have a large role to play, other than research in universities, in the funding of these developments. The university role can be critical, because the leading edge of research in some of the engineering aspects of supercomputers and in some of the organizational aspects of supercomputers, is to be found in universities now.

Senator KENNEDY. When is your report going to be ready?

Dr. KNAPP. I don't really know. I think there will be something within the next month or so, but I am not certain.

Senator KENNEDY. Well, will you make that available to us? I would just be interested in what you have asked the NSF to do. Do you have a copy of that, what you have asked the agency to do with regard to supercomputers.

Dr. KNAPP. Yes. Within the agency, I can tell you now what I have asked. I have asked the——

Senator KENNEDY. Well, who in the agency did you ask to do it?

Dr. KNAPP. I asked the Assistant Directors as a committee to discuss the problem of university access to supercomputers, and to report to me and to the National Science Board for its May meeting. There will be a formal——

Senator KENNEDY. It will be on the agenda at the May meeting?

Dr. KNAPP. It will be on the agenda of the May meeting.

Senator KENNEDY. I will ask the staff to work with your people, just with regard to that particular item at the May meeting, and we will continue to follow along on it.

I don't think there is really very much question in my own mind that both the Japanese and others are strongly committed to outdoing the United States in this particular industry. I guess you are familiar with the articles in the Post on Tuesday, April 3, where Mr. Fushi points out, "Although he would not answer the question directly, he said that he expects Japanese computer science to surpass the United States before the end of this decade."

I can tell you that view is shared by a great many of the people in my own State of Massachusetts who are in that industry. We are going to be very interested in seeing what recommendations the NSF is going to make, whether they reach the same conclusion and what recommendations they are going to have to try and help insure that that is not the case. If they are not going to make recommendations, I think that is important as well, so that we in the Congress are able to at least express our views on this matter.

Just on science education, I am sure you are very much aware of the concern of Members of Congress about the shortage of math and science teachers and the inadequate instructional equipment and materials in many of the schools around this country. What is the NSF going to do about this particular problem?

Dr. KNAPP. A program planned for fiscal year 1983 must be approved by the Senate Appropriations Committee. The plan was transmitted to the committee on Monday. It proposes programs for the development of materials for teacher training and a set of incentives for high school teachers or other teachers—it is not limited to high school teachers. The incentives include Presidential awards for teaching excellence and honors workshops for excellent teachers to learn from active scientists and take the information back to their schools.

Senator KENNEDY. At least a number of the teachers or educators I have talked to have felt that there is a very important need on the elementary school level as well; that many young students lose their interest in terms of science and a science future in the early grades, and that the stress has been on the secondary school level and the precollege level. Obviously, there should be stress at the elementary school level, too, but I am just wondering if that has been your conclusion as well.

Dr. KNAPP. It is my conclusion as well. The Foundation will respond to proposals from school districts, universities, and schools of education for the materials development programs. Those proposals, I hope, will include proposals to develop materials for the training of elementary school teachers in the presentation of science to young people.

I believe it is important to make elementary school and junior high school students enthusiastic about science. Studies have shown that alienation can occur most easily in these age groups.

Senator KENNEDY. OK. Well, I want to thank you for your response. I just want you to know that I think the community, the scientific community is concerned about insuring that the NSF is not going to be politicized. We gather, certainly, from your statements here this morning that that is both your commitment and your view as well.

I think we welcome those assurances here today, and we will be interested in the information that is developed with regard to women and minorities in the NSF program. I will look forward to having our staffs communicate about the various conclusions that you are going to reach with regard to the whole supercomputer need at your May meeting.

I think myself that there is an enormous sense of urgency about that particular question and issue, and I think you have the opportunity of working with both the various universities and the private sector. I am convinced that if we are going to do business as usual in this society, we clearly cannot put all of the responsibility on the NSF, but they have both the prestige, the influence, and the ability to have a very important impact in fashioning and shaping policy in the future. If we are just going to take a handsoff attitude with regard to that industry, I fear very much for the future just in terms of our own economy, our own security, and our ability to

insure employment for Americans and world leadership in the future.

Therefore, we are going to follow this very closely, and I know that view is shared by many, not just on this committee but many in the Senate. We will be looking forward to hearing your views and understanding your positions, and also we are going to be looking at it ourselves. I hope that we can find areas of common agreement.

In accordance with the Chair's request, the committee will stand in recess.

[Whereupon, at 11:25 a.m, the committee recessed, to reconvene at the call of the Chair.]

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